

rapidly ripening wheat, growing corn and alfalfa, all of which were practically destroyed. The swift running waters cut new channels, washed the surface of the land away in places, and covered thousands of acres with a heavy deposit of sand."

The damage to agricultural interests in this county, growing crops, land and improvements considered, will approximate \$1,500,000. Many small bridges were badly damaged. The Missouri Pacific Railroad was damaged about \$50,000. The Burlington and Union Pacific had not succeeded in restoring communication with Concordia July 3. No lives lost in this county, but boats were constantly employed from 2 a. m. to 6 p. m., Sunday, 20th, rescuing persons living in the flooded area.

Below Cloud County the damage was about \$1,500,000. The river cut new channels in several places. At Clay Center it broke through the dike and cut a new channel through a soft, spongy bottom which, if permanent, would necessitate a new bridge at a cost of \$60,000 and would render valueless a concrete dam that cost about \$50,000. But it is believed that a new dike will be built, compelling the river to return to its old channel, a more economical proposition with a more enduring prospect than attempting to bridge a river which will inevitably make new channels with each succeeding flood.

At Junction City the water was about 4 feet in depth over the railroad tracks. The flood carried out two Government bridges and one county bridge, and twisted the electric bridge several degrees out of alinement, the damages to bridges amounting to \$40,000.

The Big Blue at Blue Rapids rose from 8.7 feet on the 17th to 26.5 feet on the morning of the 18th, 5.5 feet above flood stage, causing overflow and damaging crops in the immediate bottoms from Blue Rapids to Manhattan. There was no loss of stock or bridges. The damage in the entire valley did not much exceed \$500,000.

From Solomon City to Topeka (almost equally divided between the Smoky Hill and Kansas Rivers) only slight overflow occurred (except locally at Junction City), with a consequent loss of about 15 per cent of the growing crops, amounting to about \$350,000.

Advisory warnings were frequently sent to the river observers at Abilene and Wamego and to the corn and wheat observers at Manhattan. The postmasters at Solomon City and Junction have stated that the telegrams from this office were conspicuously posted, were very valuable, and greatly appreciated. The river observer at Clay Center writes that the information telegraphed from this office enabled the people to take measures to protect their property and stock.

The damage at Topeka was slight.

East of Topeka a series of freshets occurred between May 18 and July 3. From May 18 to 28, inclusive, more rain fell within a radius of 60 to 70 miles of Kansas City than during the entire month of May, 1903, the year of the great flood. Heavy rains on May 26, 27, and 28 caused all the smaller streams to overflow, doing much damage to crops on adjacent land, carrying away bridges, etc. The Kansas River bottoms were overflowed in many places for a distance of 30 miles west of Kansas City. Local downpours formed ponds and lakes in depressions, and much damage resulted to corn, potato, and alfalfa crops. In fact, a considerable portion of the bottoms was not free from water from the latter part of May to the first week in July, and even then several weeks without rain were required to dry up the numerous ponds.

The damage to potato, alfalfa, corn, and trucking crops in the Kansas Valley east of Topeka is estimated between \$750,000 and \$1,000,000.

Although the heavy rains occurred simultaneously over the northern tributaries, the flood waters did not synchronize in the main artery. This was owing partly to the meandering courses of the streams, some of them bordered by shrubbery which, with overflowed wheat fields, retarded movement and smoothed out the crests. In addition, the maximum effect of the nearest tributary passed in the Kansas River before the next arrived, so that the Kansas Valley was spared a great flood.

The floods of 1903 and 1908 left an undesirable legacy to the farmers along the Kansas River between Topeka and Kansas City. The swift-moving currents in those floods, instead of following the channel, took a more or less direct course, cutting off curves, and in so doing, scoured out slight depressions of considerable width. Now, it happens that before the water is as high as the bank crests it enters the bottoms on the west approach of each curve, and the consequence is that water covers a much larger area and remains on the bottoms much longer than formerly. This is particularly noticeable at Linwood, Eudora, Loring, Lenape, and Holiday.

Recapitulation of flood damages on the Kansas River, June, 1915.

Solomon Valley.....	\$1,350,000
Republican Valley.....	3,000,000
Big Blue Valley.....	500,000
Smoky Hill and western portion of Kansas.....	350,000
Kansas, east of Topeka.....	750,000
Total.....	5,950,000

Estimate of highway engineers of damage to bridges, large and small, in the various counties in the Kansas River watershed, furnished Governor Capper of Kansas:

Damages to bridges in the Kansas River watershed.

Republic.....	\$100,000	Shawnee.....	\$30,000
Cloud.....	150,000	Jefferson.....	75,000
Clay.....	150,000	Douglas.....	20,000
Geary.....	125,000	Leavenworth.....	50,000
Riley.....	50,000	Marshall.....	75,000
Wabaunsee.....	20,000	Ottawa.....	10,000
Washington.....	25,000		
Mitchell.....	25,000	Total.....	1,005,000
Pottawatomie.....	100,000		

The damage along the Missouri, Kansas City to Lexington, to crops was about \$1,500,000. The damage to bridges and highways in the counties bordering the Missouri between St. Joseph and Lexington was \$161,500.

MEAN LAKE LEVELS DURING JUNE, 1915.

By UNITED STATES LAKE SURVEY.

[Dated: Detroit, Mich., July 6, 1915.]

The following data are reported in the "Notice to Mariners" of the above date:

Data.	Lakes.			
	Superior.	Michigan and Huron.	Erie.	Ontario.
Mean level during June, 1915:				
Above mean sea level at New York.....	Feet. 601.95	Feet. 579.78	Feet. 571.86	Feet. 245.12
Above or below—				
Mean stage of May, 1915.....	+0.30	+0.14	+0.17	—0.03
Mean stage of June, 1914.....	—0.51	—0.82	—1.17	—1.79
Average stage for June, last 10 years..	—0.32	—1.20	—1.11	—1.92
Highest recorded June stage.....	—1.48	—3.82	—2.66	—3.51
Lowest recorded June stage.....	+0.71	—0.12	+0.29	+0.23
Probable change during July, 1915.....	+0.2	+0.1	—0.1	—0.1